

Chapter 5

Organizational Changes in Forest Management

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Abstract This chapter describes the evolution of forest management organizations in the tropics from pre-colonial times up to the present, based on a review of literature and on case studies. In general, organizations are designed to suit the prevailing political and economic frame conditions. Generic models for forest management organizations are identified. The portfolio of these models is structured according to the sources of their production factors, namely labor, capital and land. Some contemporary organization models are outlined, detailing the inputs, the processes and the outputs. The models' functions, specific designs and relevance for rural development are stressed. Steering, monitoring and enforcement of capacity are understood as core issues with respect to further development of forest management organizations.

Keywords Organizations • Co-management • Community forestry • Cooperative • Farm forestry • Forest enterprises • Forest contractor • Forest management unit • Forest organization • Forest user groups • Joint forest management • Outgrower schemes • Participatory forestry

5.1 Introduction

Forest and tree utilization makes up an essential part of human livelihoods in many tropical countries. Today as in the past, forests and forest products, especially wood, play an essential role in the development of civilizations (Bass 1992). At each stage of development, specific forest management systems have been designed to produce the desired products and services from the forests. To implement these

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systems, the users and right holders designed organizations according to their own rules and institutions. The design of forest organizations depends on the ‘purpose’, the specific products and services the forests are to produce, and on the particular ecological, social, economic and political context (Honadle 1999). Usually forest resources are a matter of public concern. Users and right holders have to bargain to realize their interests. In general, the dominant power structures (e.g., chiefdom, kingdom, religious, colonial, democratic, economic, managerial) have always dominated the governance of forest products and services (Bass 1992) and influenced the development of forest management organizations (Pretzsch 2005).

Based on the paradigms of forestry (Chap. 2), the evolution of the main forest management concepts and the prevailing organization models are presented. Structured in stages (Pre-colonial, Colonial, Independence and capital formation, Internationalization, Polarization and Globalization), the changes in institutional structures and forest organizations are outlined.

Institutions and organizations implementing forest management are subject to the impacts of complex, ongoing global changes (Chap. 3). Success and failure, threats and opportunities play a part in identifying new ideas, recalling local knowledge and testing new organizational models of administration, cooperation and partnership. Within the globalized world, sustainability-oriented forest management, with all its facets, plays an essential role in the design of potential organizational models with an emphasis on rural development.

The chapter begins by specifying certain definitions relevant to the topic of forest management organizations, and continues with a review of the evolution of forest organizations. The combination of the production factors *labor and capital* with *land* are used to structure the models of forest management organizations. The relevant models, characterized by both socio-economic and ecological attributes, are outlined in the final part of the chapter. In practice the organizational archetypes discussed in this chapter may be modified and adapted according to the practical situation.

5.2 Some Definitions

Organizations are understood as social systems comprising a purpose, people, information and a structure (Chrobok and Büchi 1996). A more operational view describes organizations as formal bodies, established to enforce, facilitate or improve institutions, consisting of resources, responsibilities, operating procedures and rules (Bromley 1989; Dhakal and Bhatta 2009). Forest management organizations are like firms, formed to assume the functions simple market mechanisms cannot provide (Coase 1937). They reduce transaction costs and enable long-term planning. The particular ecological, social, economic and political context determines the design, establishment and performance of forest organizations (Honadle 1999), closely related to diversified general policy objectives (Pretzsch 2010).

Forest management is understood as the controlled flow of inputs and outputs of forest ecosystems in order to meet the objectives of the holders of the

property rights. Although the objectives of forest management may be multiple, not fully operational and competing, the appropriate means should be employed in order to reach the stated goals.

Forest management system denotes the technical and silvicultural design of forest management, e.g. the selection system, clear cut system, agroforestry, plantation forestry, forest gardens, slash and burn, etc.

A **forest management organization** is an enterprise, business operation model or institutional arrangement established to realize the forest management operations on the ground. Some sources use the term 'forest management unit' or 'FMU' (ITTO 2003).

Models of forest management organizations are generic forms of a forest management organization, derived from the variety of empirical arrangements in place. While some of these archetypes can be quite clearly delineated, other models overlap, with many mixed and transitional forms occurring.

5.3 Evolution of Forest Management Organizations

5.3.1 *Organization of Forestry in Pre-colonial Times*

In pre-colonial times tropical forests were either controlled by traditional hierarchical structures, such as kings, chiefs or rajas, or by other authorities (Turyahabwe and Banana 2008). The smallest units were based on groups of households and family-based organizations. Strong local institutions, like sacred forests, not only contributed to protect the interests of the powerless people (Agrawal 2005), but also served to prevent forests from overexploitation (Turyahabwe and Banana 2008).

The centralized control of forests was also practiced, as exemplified by elite hunting reserves like the one established by the Persian King Khosrov II in the seventh century BC (Bass 1992). Ancient central organizations were in place to secure actual and future timber supplies, exploit timber for the benefit of the sovereign, and to maintain environmental services (Larson et al. 2010), as well as and for cultural purposes. In India, for example the rulers controlled large forest areas, but also allowed utilization and management by local communities and princes (Guha 1983; Poffenberger and McGean 1996). Similar structures existed in Mayan and Incan organizations in America.

5.3.2 *Colonial Forest Organizations*

Colonial administration superimposed and substituted complex centralized and small-scale traditional forest management and its institutions. The objective was twofold, to produce commercial goods in the most profitable way, and to control the

territories under consideration. Forests were reserved for the production of military and commercially valuable products (Guha 1983; James 1990), but also to a certain extent for protection too (Wiersum 1999). This was achieved, for example, by means of the demarcation of ‘crown forests’ for exclusive use by the colonial power (Rueda 2008). The forests were managed by a powerful colonial forest administration, which had adopted the Western model of a bureaucratic administration: a vertical hierarchy with a strong top-down command structure and the self-conception of an authoritarian forest police (Blank 2006). Especially under the British colonial regime, control over forest resources was transferred in part to local authorities. In Uganda, for example control was granted to chieftains (Turyahabwe and Banana 2008), who in turn were under the control of the colonial governor. In British India, a district forestry officer was not only entrusted with the maintenance of law and order, he also controlled the forest land in his district, granting or leasing unoccupied forest land in order to extend the cultivated area, at the expense of forests, so as to ensure the generation of higher state revenues (Guha 1983). Forests were exploited by agencies of the colonial states, by local landlords and rulers for strategic purposes, such as ship-building, railroad construction and for fuel, but also for the export of timber and non timber forest products (NTFPs). Furthermore, other forest land was under the control of landlords who usually sought to convert the forests to cash crop plantations with higher returns. Private and company owned forest organizations were organized in the same hierarchical way as the state administrations.

5.3.3 *Forestry Organizations After Independence*

Accustomed to colonial forest tenure and administrative bodies, the new national governments took over the former colonial forests as state property. The new state forest administrations adopted a bureaucratic approach to manage the respective ‘state’ forests, whereby ancestral ownership by indigenous people and customary uses were largely ignored (Turyahabwe and Banana 2008; Rueda 2008).

Smallholder forestry and traditional agroforestry practices provided evidence for time-tested adaptive production systems. The organizational unit for forest management was mostly the family or household, adhering to the characteristics of a household economy (Auch 2007). Parallel to this, communities of various kinds took up traditional ways of managing forests. These models did in fact render the possible continuation or revival of forest utilization according to customary claims. This kind of individual forest management had been sub-summarized under the initial Community Forestry after state independence, as defined by FAO (FAO 1978). Furthermore, the absence of organizations responsible for forest management on a local level led to so-called open-access forests, where previously limited access had existed.

Following the prevailing paradigm of the liquidation of forests for the purpose of developing forest industries (Zivnуска 1966) and in order to contribute to general economic development of these countries, the state forest administrations granted

forest concession rights to private enterprises. Logging became a lucrative business for international companies (Rueda 2008). In other countries the governments initiated the establishment of state forest enterprises effectively to exploit valuable commercial timber, as was the case, for example, in Northern Vietnam and Laos at the time (Le 1988; Hartzsch 1983). Some states, which had never colonized, followed the trend and adopted centralized forest management, for example Nepal under the Rana Dynasty (Nagendra and Gokhale 2008; Kanel Raj and Acharya 2008).

5.3.4 The Internationalization of Tropical Forestry

With the decline of bilateral links which had kept on functioning for a long time after state independence, many tropical countries gradually became integrated in to international structures, following the guidance of FAO and the World Bank. An initial afforestation boom was linked to the first energy crisis and focused on the production of firewood especially for the people concentrated in the towns. However, instead of the liquidation of wood, the trend then turned more favorably towards industrial processing which achieved higher selling prices of the raw material over firewood. With the development of mechanized forestry and the production of genetically improved planting material, more private investors and corporate groups engaged in industrial forestry, driven by the growing demand and rising prices for industrial softwood products on the world market (Bass 1992). These companies were usually organized according to conventional industrial organizational structures (e.g. profit centers) with profit maximization as the overall goal. The large-scale reforestation projects implemented were often poorly integrated into existing social structures and had ecologically destructive impacts (see Chap. 3). Forest concessions continued to expand in natural forests. Over the years a concentration process took place, resulting in the establishment of some very large consolidated companies which operated on different continents.

5.3.5 Polarization

During the stage of polarization, there was a diversification towards three objectives of forest organizations. In addition to state administration and private sector business-orientated enterprises, diverse organization types engaged in various forms of social forestry and nature conservation (Uphoff 1993). Social forestry was launched in India in the early 1970s where the government started a program of tree plantings on degraded village land outside the forests to supply the rural population, especially small holders and landless people, with domestic firewood, small timber for construction purposes and minor forest products (Prasad and Bhatnagar 1995). Organized and implemented by government institutions, the villagers were expected to contribute labor only. This model was adopted by

many actors, driven by the insight that the industrial forestry model prevalent at the time had failed to contribute to rural development (World Bank 1978; FAO 1978) or to solve pressing ecological issues, such as the large-scale deforestation of fragile land. Consecutively, modified forms of *Social forestry* were designed, and this became one of the umbrella terms for forestry projects targeting basic needs and subsistence use in numerous tropical countries (Nair 1993). The concept was further developed into a variety of similar models that stressed the pursuance of social objectives and the benefits for poor populations, such as the Joint Forest Management model launched by the Indian government during the 1970s (Colchester et al. 2003).

Striving for more efficient governance and management of forests, a new Community Forestry approach was promoted which had originated and been in use in Nepal since 1976 (Nagendra and Gokhale 2008). Under this model, a substantial portion of government forest land was transferred to local communities (panchayats), the forest administrations were decentralized to the same level, and the role of the Department of Forestry changed from supervisor to that of an advisor and facilitator (Kanel Raj and Acharya 2008). Interested villagers were obliged to form forest user groups in order to apply for a piece of the community forest. The model spread to many other areas and was accepted as a recommended model for sustainable resource management (Arnold 2001).

In time, the notion of the model changed, from the provision of a purely domestic household supply of forest products, to market production for cash income generation. Besides livelihoods and the empowerment of the forest users, the supporters' objectives also included protection goals (soil, habitat, biodiversity, water) (Wiersum 2010; Dhakal and Bhatta 2009). In order to fulfill these sophisticated goals, the forest organization had to further upgrade administration and governance. Each country shaped its community forest designs quite individually, to fit in with the given policies, structures and cultures. Essential elements now include the property rights conferred, the commercial value of the forest produce, the size of the forest, and the number and homogeneity of members of the respective communities. To transfer forest use rights, community members must establish or appoint a legally recognized organization to represent the community, the desired area must be delineated (at the consent of other governmental ministries and the neighboring communities) and be formally attached to the established organization with an agreement between the community body and the government. A management plan is usually required. In most cases forest rights are granted for a limited period of time only, but can be renewed. The government maintains the right to revoke the rights to a forest area if the agreed terms of reference are not fulfilled. The community forest organization requires an additional effort on the part of the community members (relatively high transaction costs), but provides a structure for good governance and empowerment at community level.

However, the outcome of social and community forestry programs did not always meet the high expectations: the degradation of forests could not be sufficiently controlled; forest rehabilitation advanced rather slowly and rural people remained poor. The projects were designed within a technocratic planning process

and implemented by governmental institutions in a top-down manner, without respect for or participation by local people (Colchester et al. 2003). The different benefits sought by the government (reforestation and a share of timber trees) and by villagers (cultivation of crops, rearing of animals and harvesting of NTFPs) resulted in contradictory management objectives (van Noorwijk and Tomich 1995) and ultimately in limited success.

When collectivizing the variations of community focused and community based forest management models, the technical terms Participatory Forestry (Schreckenberg et al. 2006) and Collaborative Forest Management (Carter and Gronow 2005) emerged as umbrella terms for the various forms and models of the management of public forest land by local communities.

5.3.6 *Globalization*

Smallholder forestry on farms and small and medium forest enterprises provide evidence for ancient and adaptive production systems. Many new smallholder properties were created as a result of resettlement programs and unregulated migration into tropical forests (Kinsey and Binswanger 1993). Now, the management of the remaining forest patches on these smallholder properties, together with tree plantations, agroforestry systems and the farm land are at the discretion of the individual farm owner. The organizational unit for forest management is mostly the owner's family or household, adhering to the characteristics of a household economy (Auch 2007). The area of privately owned forest has increased, especially in Asia and South America (12 % in China, 20 % in Colombia). This increase is mainly made up of planted forests (FAO 2010). Today, smallholders are being increasingly recognized as important actors in the context of global change, food production and rural development.

The development of outgrower schemes on a large-scale was a reaction to decreasing land resources. Outgrower schemes are contractual arrangements for vertically coordinated production relations, initially formed for the large-scale production of agricultural export crops. The first reported forestry scheme of this kind dates back to the 1970s, when a state-run Philippine paper mill supported smallholders in planting pioneer trees on fallow land around the mill's concessions, in an attempt to protect the land from illegal settlers (Rueda 2008). Outgrower schemes are either market-driven, where companies contract smallholders to grow raw materials on a long-term contract basis, or they are centrally planned development interventions to combine the supply for processing plants with the incomes of surrounding smallholders (Dillon 1992; Little and Watts 1994; Mayers and Vermeulen 2002). In many cases the growers are not able to negotiate beneficial agreements with the company (Race et al. 2009).

Forestry contractor enterprises emerged as a reaction to the outsourcing of many activities by state and private enterprises. These offer forest management services without owning forest land. Often as small but specialized private business enterprises, the 'contractors' (UNECE/FAO 2008) offer planting, logging, extraction

and haulage services employing specialized equipment. In the tropics such contractors can be found in areas with a certain proportion of plantation forest and with established markets for timber (refer to Boxes 5.4 and 5.5). The contractor complements the smallholder tree grower and this enables both to benefit from the economies of scale.

Recently, new investment forestry enterprises have been established. Since the financial crisis in 2008, high yielding forest plantations are increasingly being included in diversified investment portfolios, promising ‘clean’, ‘green’ and secure demand markets, as well as high, sustainable returns. New forms of funding have also evolved, for example ‘green investments’ and ‘crowd funding’ (Chap. 10). The organizational units on the ground, managing the forests according to the investors’ standards and provisions, are, however, usually commercial companies or contracted community organizations. The investment model comprises the investors, a central finance institution organizing and selling investment products as well as holding and monitoring the forest enterprise, and the forest enterprise on site which implements the forest management according to the required standards.

5.4 Model Design

5.4.1 Portfolio of Forest Management Organization Models

The types and varieties of forest management organizations and their operational arrangements are manifold. Some generic models are presented in Fig. 5.1. The ownership of the classical economies’ production factors is used for the models’ structure:

1. *Labor and capital*: the models are first grouped according to their legal basis, which is either ‘public’ or ‘civil’ law. ‘Public’ entities are owned by all citizens and are usually controlled by the government. They include entities owned by public bodies or territorial authorities, such as municipalities and communal bodies, but also indigenous groups of people. ‘Civil’ entities may be owned by a group of individuals or by a single individual. The latter comprises family or household-owned entities and commercial firms. Usually, the members of these groups have had to contribute financial resources to the organization and they have the right to make decisions concerning both the affiliation of new members and the entity’s contributions to cooperatives or private companies.
2. *Land*: Despite the fact that land ownership is not a binary variable for multiple kinds of use rights that an individual or community can possess (Nagendra and Gokhale 2008, p. 721), ownership of land in the context of this chapter is defined as the right of alienation, i.e. the right to sell or lease the resource (Schlager and Ostrom 1992, p. 251). In its narrow legal sense (*de jure*), ownership comprises two categories at the first level: ‘public’ and ‘privately owned’ forest land. ‘Public’ land is owned by either the central/national government (all citizens) or by public bodies and territorial authorities, such as communities and

Production factors labor and capital		Production factor land		
		Owned by state (government)	Owned by groups	Owned by individuals
		Under public law		Under civil law
Government	Under public law	<ul style="list-style-type: none">▪ State forest administration▪ State forest enterprise	<ul style="list-style-type: none">▪ State forest management service▪ Trust forest*	<ul style="list-style-type: none">▪ -
		<ul style="list-style-type: none">▪ Community forest▪ Co-management▪ Agro-extractive reserve▪ Joint forest mgmt.	<ul style="list-style-type: none">▪ Community forest▪ Communal forest enterprise	<ul style="list-style-type: none">▪ -
	Under civil law	<ul style="list-style-type: none">▪ Concession▪ Forest user group▪ Co-management▪ PES**	<ul style="list-style-type: none">▪ Forest-user-group▪ PES**▪ Co-management▪ Concession	<ul style="list-style-type: none">▪ PES**▪ Co-operative▪ Producer association
		<ul style="list-style-type: none">▪ Taungya▪ Leasehold▪ Conservation contract	<ul style="list-style-type: none">▪ Traditional / customary***▪ Outgrower scheme	<ul style="list-style-type: none">▪ Farm forestry▪ Outgrower scheme
Groups	Under public law	<ul style="list-style-type: none">▪ Concession▪ Leasehold▪ Service contract	<ul style="list-style-type: none">▪ Concession▪ Service contract	<ul style="list-style-type: none">▪ Forestry enterprise▪ Leasehold▪ Service contract
Individual commercial - household	Under civil law			

Fig. 5.1 Generic models of forest management organizations in the tropics

Models structured according to the entities providing the production factors *labor and capital* on the y axis and *land* on the x axis. Bold print indicates models presented in Sect. 5

*Forest owned *de jure* by indigenous groups, managed by state forest administration, e.g. Kakamega forest, Kenya; ** Payments for environmental services; *** e.g. Ejidos in Mexico

indigenous groups. The ‘private’ category refers to land, subject to legal land titles, held by groups or individuals as private property in accordance with the provisions of civil law. Typically the rights relating to privately owned land cannot be terminated unilaterally by a government; this requires a formal process and compensation (White and Martin 2002). Generally privately held property is more secure in terms of the withdrawal of land use rights or expropriation by the government. Groups with private rights have a stronger claim to control over and benefits from the forests than groups with customary rights on public land only (ibid.).

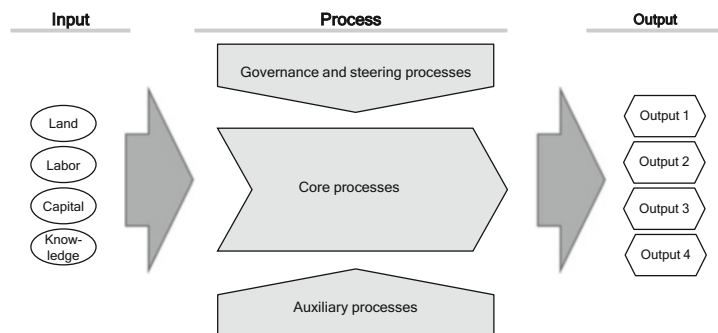


Fig. 5.2 Generic input-process-output scheme for forest management organizations

5.4.2 *Input-Process-Output Scheme*

For a holistic understanding of forest management organizations as social systems, an *input-process-output* scheme is designed (Fig. 5.2). It represents a causal model, applicable to all organizations. The inputs are the available resources, and the outputs result from the transformation processes applied (Andersen 2010; Emery and Trist 1965; Stogdill 1967). Inputs are the classic production factors *labor*, *capital* and *land* provided by the base organizations. *Knowledge* is specified separately, to allow for its contribution independent of labor and capital (cf. Li et al. 2004). The transforming processes are grouped into *core processes* (production of outcome-relevant products and services), *steering processes* (including strategy, decision-making, coordination, supervision) and *support processes* (enabling the other processes to operate) (Miebach 2009; Gaitanidis 2007; Schober 2002). Outputs are the products and services generated with a value (relevance) for the base organizations and their clients.

Some forest management organizations may own all of the production factors, for example a state or a farm forestry enterprise. Others are designed as joint ventures between the owner(s) of the forest land and those tasked with forest management, providing capital and labor.

5.5 Selected Contemporary Models

5.5.1 *Farm Forestry*

Farm systems may integrate agricultural activities with natural forest, planted forest or agroforestry systems as production components. Such mixed farm designs are common in areas where trees dominate the natural ecosystem, as well as in areas with unfavorable conditions for cropping and grazing, such as poor soils or steep slopes.

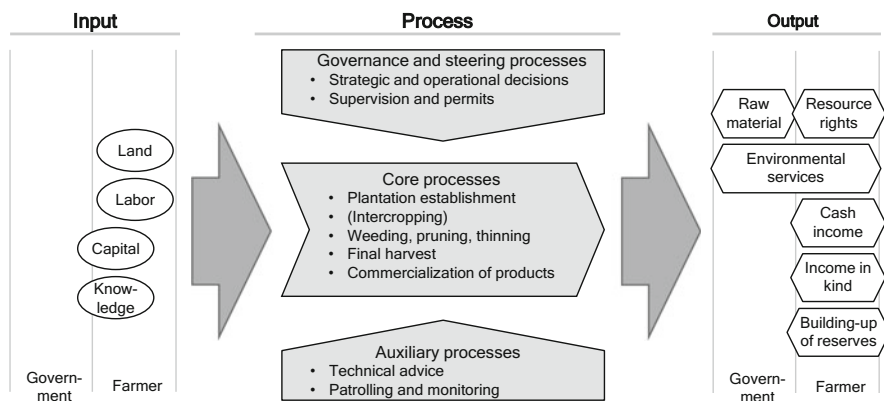


Fig. 5.3 Input, process and output of farm forestry (planted forest)

On-farm trees and forests are typically used to support other farm activities, and are for household consumption and commercial purposes (Pretzsch 2010). They also contribute to environmental services and household resilience. Farm forestry is an option for the use of marginal land and a means to rehabilitate degraded land, diversify income and secure property rights (Nsiah 2010; Darr 2003).

The availability of land, knowledge, labor and equipment are hurdles to negotiate when entering into forestry activities. Yet, as most farms have at least some of these factors already in place, fixed cost sharing allows mixed farmers to operate farm forestry profitably on a quite small scale; a scale on which purely forestry enterprises could not survive on their own. Figure 5.3 shows the analysis of forest plantations on a farm. Usually the inputs are provided by the farmer, often specialized knowledge is offered by extension services. Due to the long production cycle, insecure or monopolistic output markets hamper farm forestry, as do discontinuous state policies. The establishment of a tree plantation is a high investment in terms of labor (e.g. for land clearing, site preparation and planting) and materials (e.g. seedlings, fertilizer) for the farmer. Given the expected supply of raw materials and environmental services, most governments support tree growing on private land through the provision of technical advice, credit facilities, planting material and marketing support. In addition to the establishment of the forest, the farmer's ongoing activities cover monitoring and fire prevention means, pruning and thinning. Thinning usually brings the first positive returns. Full revenues are realized at the end of the rotation.

With the increasing global demand for agricultural products, the establishment of forest plantations is limited to marginal agricultural and/or degraded land. Agroforestry systems, providing multiple agricultural, animal and forest products, constitute other land-use alternatives (see Chap. 4).

Small scale tree growers often lack experience in the marketing of timber and usually depend on intermediary brokers. Compared to the growers' share, these middlemen often receive a disproportionately large portion of the profits. Due to the

poor infrastructure and the farmers' lack of direct market access, middlemen are however often indispensable in organizing the critical links between growers and the processing industry (Race et al. 2009). Improving the supply of information to farmers with respect to market prices, educating them on the functioning of factor and output markets, linking them to competing buyers and increasing their confidence and the skills needed to negotiate with business partners are prerequisites if farm forestry is to become a pathway out of rural poverty (*ibid.*, see also conclusions on value chains in Chap. 6, Sect. 6.5).

From a management perspective, farm forestry offers a land use with reduced labor inputs compared to agriculture, and sometimes with a higher return on labor (see Box 5.1). On-farm forest activities have to fit into the whole-farm activity portfolio and resource budgets (Negussie 2003). An example of farm forestry with a natural forest component is described in Chap. 4, Box 4.1.

To a certain extent, small, family-based farms follow an economic rationale that differs from that of conventional commercial enterprises. Profit maximization in financial terms is not necessarily the prime objective. Often aspects such as overall utility, resilience, risk aversion and household survival are more important (Ellis 1992). Culturally determined norms and group values may also influence management decisions (Zitzmann 1998; Xayvongsa 2001). Small farms in the tropics and subtropics often operate under shaky framework conditions, characterized by a lack of market access, credit facilities and permanent land titles (Pretzsch 2010).

Compared to agriculture, farm forests in the tropics are often lucrative in terms of the return per unit family labor, but not in the absolute turnover per unit of land (Box 5.1). Under competitive market conditions, farm forestry is economically viable in many tropical countries (e.g., Pretzsch 2010; Mayers and Vermeulen 2002), and farm forests are often in a better state than public forests (Royo 2011).

Given their medium to long-term nature, farm forestry investments are difficult or impossible for poor and very small farmers to undertake. Usually, the benefit from forest resources to better-off and middle-income farmers is proportionally higher. Only under stagnant forestry conditions, when better-off farmers look elsewhere for the few opportunities available, is the benefit from forest resources enjoyed by the poor proportionally higher (Pérez et al. 2004, cited in Hobley 2007). Given that farm forestry requires less labor to utilize the land than typical agricultural activities, it particularly suits the livelihood strategies of better educated households, who tend to allocate more family labor to off-farm work (Jolliffe 2004).

Farmers have to decide between marginalization and the exodus of rural populations, or new green revolutions (Otsuka and Larson 2013), or else pursue a new course (third way) which involves combining their skills with elements of the market economy, technology and partnerships. In the rural areas of the future, diversified small farms will provide a basis for the livelihoods of families and their social net. With strong links to value chains, their production and marketing can be organized more efficiently, the value of their products can be increased through grading and processing and their strength can be enhanced by cooperating with other producers.

Box 5.1 Farm Forestry in Ghana

Although less than 10 % of the original forest remains in Ghana, the annual national deforestation rate is still 2 %. A growing timber industry, the demand for firewood and ambitious national development programs are driving the demand for roundwood, which currently lies at about 2.5 times the annual allowable cut. Forest plantations on both state and privately owned degraded land were established to bridge the gap in the supply. This forest plantation program was initiated by the government in the early 1980s, and several thousand hectares of forest plantation have been established since.

In the Offinso District most plantations have been designed as taungya-type agroforestry systems, with teak (*Tectona grandis*) or *Cedrela odorata* in the upper storey, intercropped with food crops for the first 4 years. The average plot size is 2.9 ha and nearly half of all households possess a forest plantation. Farm forestry is generally undertaken by better-off households, characterized by larger land holdings, more secure land titles, more household labor, higher levels of education and a higher per-capita income.

The farmers establish their plantations themselves, with the Forestry Commission providing high quality seedlings. Farmers also use wildlings harvested from existing forest plantations and planting material procured from private nurseries. Weeding and fire protection measures are carried out annually after site preparation and planting, while pruning and thinning start from year five on. Some farmers also establish a fire break around their plantations. The total labor input for a teak plantation over 25 years is 750 man-days/ha (one man-day equals 4 h work and is paid USD 2.20), while intercropping requires almost twice this. Pure cropping necessitates five and a half times as much labor input. The mean annual volume increment of the teak ranges between 12 m³/ha and 17 m³/ha.

The food crops produced are sold and/or consumed by the household members. The teak stands are harvested after 10–25 years. Depending on the diameter, logs are used as telephone poles, for furniture or construction, as well as for export to Asia. Farmers are paid for standing trees, so those farmers capable of measuring tree volumes have an advantage over those who cannot. Despite the fact that middlemen they pay less for the trees, most farmers sell to them because they are easier to access than the processing companies.

The buyer applies for a harvesting permit, fells the trees at his own expense, applies for a transport permit and finally hauls the logs after verification by a forest officer. Farmers are paid after felling.

The net present value of a pure teak plantation over a 25 year rotation at a 12.6 % discount rate is USD 53.20/ha. The equivalent for pure maize and plantain cropping is USD 520.50/ha, and USD 962.20/ha for teak with intercropping. Intercropping requires a higher initial investment but provides

(continued)

Box 5.1 (continued)

positive returns in the first 4 years. The profitability per labor unit invested (undiscounted values, costs to finance material and land not considered) is highest for the pure teak stand (USD 17.77/man-day), medium for intercropping (USD 11.62/man-day) and lowest for pure agriculture (USD 2.19/man-day).

Source: Nsiah (2010)

5.5.2 *Community-Based Forest Management (CBFM)*

Community-based forest management combines sustainable forest management with support for rural livelihoods. It is perceived in the context of devolution as an optional public model to overcome the ineffective management practiced by central government institutions (see Box 5.2). Usually CBFM is organized under public law. Per definition, all legal dwellers in a distinct area, for example, a commune, are automatically members of the community forest and part of the management. Often CBFM is based on a traditional system of community management (Nagendra and Gokhale 2008). The general objectives of CBFM are to: (1) sustain forest resources and environmental services, including the conservation and rehabilitation of forest land; (2) contribute to local livelihoods, including poverty alleviation; (3) protect the property rights of local dwellers; and (4) maintain public property rights and public control via state and government institutions. Community forest management is based on the assumption that only users who benefit will develop a sense of ownership, thus motivating them for active protection of the forest against anthropogenic and natural threats from outside and from the community itself. Box 5.2 illustrates the costs and difficulties associated with the protection of a common pool resource in Vietnam.

Figure 5.4 illustrates the major characteristics of the community forestry model. Essential inputs are: the resource forest land, demarcated with at least the corner points; the formally defined and organized members; a body responsible for management, communication and decision-making; in some cases hired staff and a supervising institution, usually a government body. Often non-governmental organizations support the establishment and management of the forest. The management of the community forest comprises typical tasks of public enterprises, such as maintaining environmental services; and has many other similarities with public forest enterprises, including long-term and annual planning, decision-making controlled by members, budgeting and benefit sharing, transparent financial management and accounting, organization of forest operations and marketing of forest produce, monitoring of the resource, supervision of staff, and communication with members and stakeholders. Operational forest management tasks, such as harvesting, are often implemented by the members on the basis of use regulations for domestic products and permits for high value commercial forest products.

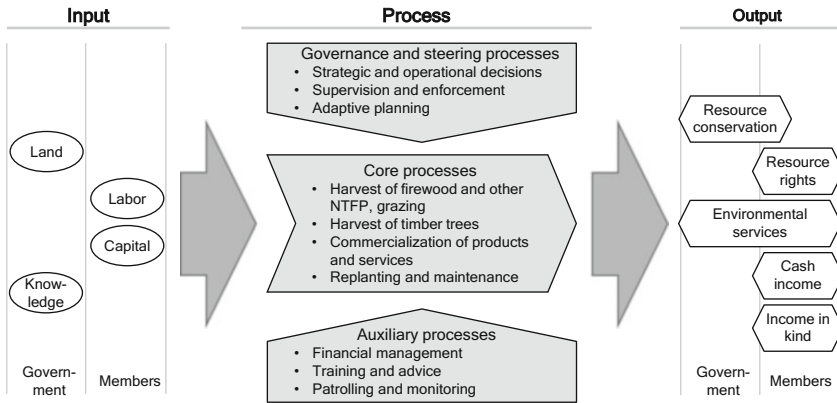


Fig. 5.4 Input, process and output of the CBFM model

Outputs include improvement of the forest resource, secured ecosystem services, higher land tenure security for members, a range of consumable forest products and services both for household use and for sale, and indirect benefits such as increased community resilience through the provision of a safety net in times of emergency, increased employment through the development of downstream processing enterprises, and direct income from salaries and compensation measures. Occasionally cash incomes from community forest are quantified, whereas products and services consumed for subsistence and the increased community resilience are difficult to measure and are therefore often underreported (cf. Larson et al. 2010).

Evidence of the effectiveness of community forestry is mixed. Looking at ecological sustainability and resource rehabilitation, reports from Asian countries typically claim positive results, whereas the findings from Africa and Latin America are less optimistic (Larson et al. 2010; Pokhare and Nurse 2004; Dougill et al. 2001; Nagendra and Gokhale 2008). The CBFM model works where the forest resource provides enough net benefits to fund the organization (see footnote 1: (2) *congruence*). Van Laerhoven (2010) identified the following as being the most prominent features of successful sustainable community forest management: the ability to learn from collective problem-solving, the presence of leaders and the freedom to design governance regimes, while competing groups of members complicate the good governance of community forests. Other limiting factors are weak state control, unmotivated proponents and community forest members lacking information and a capacity to defend their rights (Cronkleton et al. 2012). If community forestry does not curb the absolute demand for forest products, the ecological status of community forests might improve at the expense of neighboring forest areas that are being depleted more rapidly, as observed in Madagascar (personal communication with K. Ackermann). In general, community forestry has had a positive effect on livelihoods, with members mostly experiencing improvements, and with only a few negative impacts on livelihoods (Larson et al. 2010).

Livelihood improvements are largely determined by the amount of harvestable high-value timber available (Iversen et al. 2006).

The most common problems facing CBFM include the allocation to communities of poor-quality forest land; conflicts between communities provoked by the transfer of exclusive forest use rights; programs over-emphasizing collective activities; a lack of transparency in financial issues and too much bureaucracy and paperwork (Kaimowitz 2005). Furthermore, CBFM often fails to benefit the less powerful and poor households equally (Carter and Gronow 2005; Adhikari et al. 2004; Campbell et al. 2001; Hobley 2007). Monitoring and sanctioning have been found to be the most critical factors for the success of sustainable community forest management (Singh et al. 2011; Coleman and Steed 2009).

Despite these fundamental problems, CBFM is a promising option, particularly for forests required to fulfill public welfare functions, such as conservation and environmental services (cf. Colchester et al. 2003; Bakarr 2005). The vital governance principles were identified by Ostrom (1990, p 90)¹ and confirmed by others (cf. Cox et al. 2010; Singh et al. 2011).

An example of CBFM in Vietnam, in the form of ‘village forest management’ (VFM), is outlined in Box 5.2. The example shows the collective action weaknesses of the CBFM model. To overcome these problems an organizational model with small member groups was developed, the sub-VFM. This sub-VFM is a forest user group (FUG) model. In this case the steps taken led to greater active participation by marginalized groups, conflict resolution, supervision and enforcement by the authorities.

¹ Ostrom (1990, p. 90) identified the following principles for enduring common-pool resource institutions: (1) *clearly defined boundaries* (individuals or households with rights to withdraw resource units from the common-pool resource and the boundaries of the common-pool resource itself are clearly defined); (2) *congruence* (A. The distribution of benefits from appropriation rules is roughly proportionate to the costs imposed by provision rules. B. Appropriation rules restricting time, place, technology and/or quantity of resource units are related to local conditions); (3) *collective-choice arrangements* (most individuals affected by operational rules can participate in modifying operational rules); (4) *monitoring* (monitors, who actively audit common-pool resource conditions and user behavior, are accountable to the users and/or are the users themselves); (5) *graduated sanctions* (users who violate operational rules are likely to receive graduated sanctions, depending on the seriousness and context of the offence, from other users, from officials accountable to these users, or from both); (6) *conflict resolution mechanisms* (users and their officials have rapid access to low-cost, local arenas to resolve conflict among users or between users and officials); (7) *minimal recognition of rights* (the rights of users to devise their own institutions to organize are not challenged by external governmental authorities). For common-pool resources that are part of larger systems: (8) *nested enterprises* (appropriation, provision, monitoring, enforcement, conflict resolution and governance activities are organized in multiple layers of nested enterprises).

5.5.3 *Forest User Groups*

A forest user group (FUG) is a formal association of individuals with exclusive rights to the management of a delimited public forest area. Sometimes this is also labeled ‘community forestry’, but in contrast to the CBFM model, only a limited number of individuals (or households) from a whole community (village, settlement, hamlet) belong to the FUG. In some cases, as in Nepal, an individual can become a member of more than one FUG, if he or she is interested in specific products from different forests. Generally FUGs are organized under civil law as cooperatives, with a constitution, member register and committee. The FUG, as a legal body, enters into a legal agreement with the state to use the forest land, subject to the defined rights and obligations of both parties.

The inputs, processes and outputs are similar to those of the community forestry model presented in Fig. 5.4. FUGs often receive highly degraded forests or even bare land for reforestation. In some cases, the FUG members use the allotted forest plot jointly; in others they subdivide the area and each member receives a plot of his or her own. FUG members elect a committee to organize and communicate FUG issues, such as plot identification and allocation, technical advice and support, central facilities and services like nurseries, the drafting of a management plan, logging, marketing and financial management. The members implement the practical operations, such as tree planning, weeding and thinning, and take part in group meetings. FUG membership requires active participation in forest management decisions, plus contributions to forest management operations. The committee keeps a part of the revenues from timber sales to meet administrative costs.

As the sub-VFM groups presented in Box 5.2 illustrate, the FUG model overcomes certain weaknesses of the CBFM model, such as unbalanced power structures, unfair benefit sharing, low motivation of occasionally anonymous members and low economic efficiency (Tuan 2006). The FUG approach suffers less from collective action problems, it is market-oriented and it is able to unlock entrepreneurial engagement (Pretzsch 2010). It may also be a favorable way of improving the efficiency of public forestry as long as the poor can be integrated (Bastakoti 2005). However, the individual design of the model creates the risk of a socially unbalanced use of public forests. The poor and weaker citizens may not have been strong enough to enter the FUGs or been able to establish their own FUG’s when the public forest resources were distributed. As a consequence, they are thus excluded from the forest resources which were once available to them and are even more marginalized than before. The CBFM model prevents such formalized disadvantages.

Box 5.2 Village Forest Management in Vietnam

In Vietnam 2.4 million hectares, 13 % of the country’s forest land, is managed by local communities. These forests are managed collectively, either by local village communities or by sub-groups of forest users.

(continued)

Box 5.2 (continued)

Community forest management in Vietnam has its roots in traditional forest management by villagers. In 2004 a national law provided the option to formally contract forest land to communities. In this case the community forms a 'village forest management' (VFM) to set up their own 'collective choice rules' (rules to make operational rules) for the purposes of forest management and utilization. These include voting regulations and 'operational rules' like access (who can access what product), harvest (firewood, bamboo, grazing, other NTFPs; and where, when, how much), penalty for violations, contributions of the members (monitoring and patrols, firefighting, planting), conflict resolution and rewards for detecting and arresting rule violators. The rules are made individually in each village. The VFM concept has been further developed to allow the formation of forest user groups (sub-VFM). Even where there are sub-VFM groups, the determination of 'collective choice rules' remains at village level. The sub-VFM groups, however, make their own 'operational rules' in accordance with the 'collective choice rules'. Generally, these are more conservative and more specific, with quantitative limits with regard to harvesting periods and quantities.

In contrast to the sub-VFM groups, the VFM group members rarely invest in enrichment planting or in the maintenance of the forest. Under both models each member has to pay an annual fee (a certain quantity of rice) to compensate the forest guard. All members utilize the forests, mostly for firewood, bamboo and NTFPs. VFM members use forest produce mostly for domestic purposes, whereas use by sub-VFM members is mostly commercial.

In the year 2004, the average forest area per household member (hh) was higher for the sub-VFM (0.64 ha compared to 0.33 ha), the margin per hectare was higher for the sub-VFM forest (USD 52.57/ha compared to USD 41.91/ha), but the average return on one man-day household labor was higher for the VFM (USD 3.52/hh compared to the sub-VFM USD 1.22/hh) due to planting, maintenance and much more frequent patrolling. The fair sharing of benefits and obligations was lower for the VFM. While the forest area of the sub-VFM could be maintained, the VFM lost land as a result of the illegal establishment of private agricultural fields. The sub-VFM groups outperformed the VFMs with regard to the quality and richness of their forests.

Community forests governed by small sub-VFM groups are significantly more sustainably and equitably managed than the forests managed by the larger VFM groups. The sub-VFM groups are ready to invest more labor for long-term benefits and for the resource as a whole.

Source: Tuan (2006)

5.5.4 *Leasehold Schemes*

Under leasehold schemes a certain area of land is given to an individual user (lessee) for a specified period of time for utilization, with agreed returns for the lessor. Forest lease agreements allocate a distinct area of forest land to individuals or households for their exclusive use; the rent to the lessor is often based on the overall improvement of the vegetation cover (Naina 2011, see Box 5.3) or the quantity of major forest products harvested. Leaseholds are civil law contracts between the landowner and the user, based on customary institutions and traditions or defined juridical understanding. Lease arrangements are usually uncomplicated and less commingled with politics than permanent transfers of land use rights. The leasing of land is well-established in agriculture, but so far relatively uncommon for forest land. The ‘leasing out’ of well stocked and intact forests is usually done as a concession. Cleared forest is leased out for the establishment of forest plantations (e.g. Maansson 2003), and degraded forests for the purpose of forest rehabilitation or restoration.

Private or community forest land is occasionally leased out to private sector companies for commercial tree production (Maansson 2003; Race et al. 2009; Rueda 2008; Jørgensen and Vivekanandan 2003). Lease arrangements with households to use degraded state forest land for the purposes of rehabilitation are common, as for example in Nepal (Box 5.3), Vietnam (Box 5.2) and Indonesia (Naina 2011). The model is illustrated in Fig. 5.5. The state typically provides land, advice and planting material. The lessee mostly contributes labor for the replanting of trees and useful shrubs, and the sowing of grass. Until the first thinning, the lessee mainly benefits from the extraction of NTFPs like fodder and/or thatching material. To provide additional benefits during the initial period, some lease contracts allow taungya intercropping and the establishment of cash crop trees such as coffee (Naina 2011).

Leasehold forestry is popular for pro-poor development interventions. Experience in Nepal shows that it successfully improves the ecological state of degraded forest land, but that improvements to the lessees’ livelihoods are less than expected (Bhattarai et al. 2007). The socially balanced allocation of plots is problematic, creating conflicts and new inequalities (Thoms et al. 2006). Compared to intact forests, degraded forests require high initial investments in labor and material. Amongst the different models for the transfer of public forest land to individual users, the leasehold model offers a robust setting for the securing of high investments from the partners.

Box 5.3 Leasehold Forestry in Nepal

In 1993 the ‘Hills Leasehold Forestry and Forage Development Project’ was launched. Its aim was to alleviate poverty amongst the poorest of the rural households by leasing them a piece of highly degraded forest land for fodder production and reforestation. As the very poor families with little or no cultivated land depend on husbandry, the project strategy was to integrate forestry and livestock by means of providing exclusive land use.

(continued)

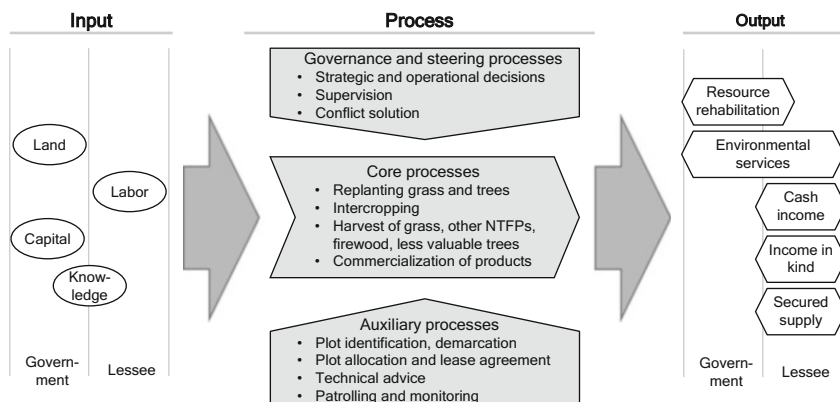


Fig. 5.5 Input, process and output of leasehold forestry in Nepal

Box 5.3 (continued)

The households were selected on the basis of a maximum land ownership of 0.5 ha and a maximum annual income of USD 40 per capita. Demarcated plots of up to 1 ha were leased to the selected families, organized in almost 2,900 small groups of 5–15 households. The plots had to be replanted with grass and different species of trees. Each family was allowed to use the grass, NTFPs and low value timber trees, whilst the right to use valuable timber trees and large trees rested with the state.

The leasing process consisted of three major consecutive steps: submission of application, preparation of operational plan and approval by the District Forestry Office (DFO). Only plans with a positive net benefit were considered. Before the handover of the area to the community group, a 35 day notification of the decision was put in place, and only if there were no objections was the land handed over.

The DFO supported the rehabilitation process by providing planting material and technical assistance. The lessee was responsible for tending the plot and was granted the right to exclusive use in return.

In cases where leasehold forestry was implemented close to nearby community forestry schemes, the leasehold groups frequently experienced encroachment from community forest members, for example illegal grazing or theft of planted seedlings. It was easy for the better-off community members to ignore the rights of the disempowered households from the poorest sections of society. The rehabilitation of the leasehold forests was successful. However, immediate poverty alleviation also required the enforcement of the rights of the poorest people.

Source: Bhattarai et al. (2007); Nagendra and Gokhale (2008); Thoms et al. (2006)

5.5.5 *Outgrower Schemes*

Forestry outgrower schemes are contractual partnerships, typically between small scale landholders (growers) and commercial companies, for the production of marketable forest products (FAO 2001). Through vertical coordination (Mighell and Jones 1963), outgrower schemes connect rural people with global markets. The core of any such scheme is the outgrower contract, specifying the terms of the cooperation. This includes the deliverables and services provided by the company to the grower (e.g., credits, technical advice, materials); the quantity, quality and timing of produce to be delivered to the company; and finally the price, or references for the price, the company is prepared to pay (Binswanger and Rosenzweig 1986; Little and Watts 1994; Cairns 2000). These contracts also entail the right of the company to reject substandard produce (Glover and Ghee 1992), and often the obligation of the grower to sell exclusively to the contracting company (Watts 1994).

Outgrower schemes can be categorized into two types: arrangements in which growers are responsible for production while the company guarantees purchase of the final produce at a predetermined price; and those in which the company assumes responsibility for production and pays landholders market prices for their produce allocations (Maansson 2003).

While outgrower schemes provide comparative economic advantages for the company in the production of specific commodities, most forestry outgrower schemes are also promoted as a form of development intervention with multiple benefits. As the power of the company is much greater than that of a normal grower, the company takes on a special social responsibility. Good practice schemes only contract landholders with a minimum area of land; enough to secure sufficient production for their own domestic consumption on top of the contract production.

To enter into an agreement on the growing of forest products (on privately owned or designated community land), the plot of land must be suitable for tree growing, including water and conservation restrictions. Usually the company's experts assess the proposed area first. Having entered into the agreement, the grower applies for the necessary reforestation permits, takes on a credit to prepare the land, plants the seedlings and establishes fire breaks – all with the company's technical advice. The grower is responsible for the maintenance and ongoing monitoring of the plantation, and for any other management activities prescribed by the company (Fig. 5.6). While some of the services provided to the grower are free of charge, others, like advance payments and credits, are deducted from the final payment made by the company at the time of harvest. The collateral is the plantation itself. The production risks formally rest with the grower. The harvest is typically organized in coordination with specialized logging and transport service providers. Final payments are based on the amount of timber registered at the mill gate. Outgrower contracts may be agreed for one tree rotation only, or for more. In the latter case, some of the final payment may be used to establish the next crop of trees (cf. Cairns 2000; Howard 2005).

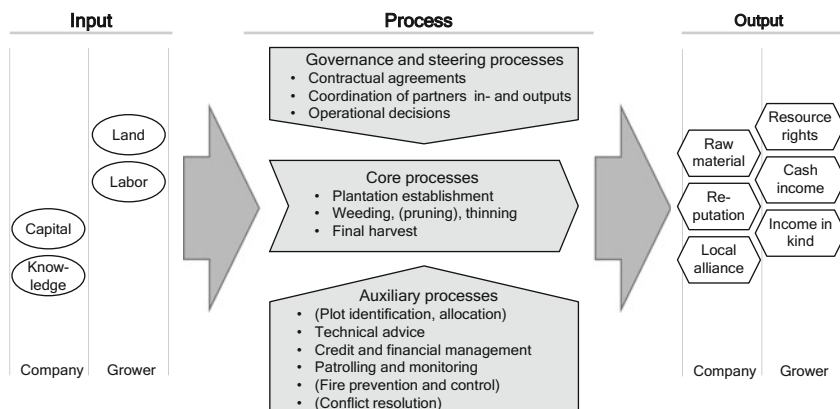


Fig. 5.6 Input, process and output of a forestry outgrower scheme

Motivations for the grower to enter into such an agreement are additional income opportunities, diversified farm production, the option to better use underutilized land, secured sale contracts, technical and financial support, secured land tenure and tree rights. The major advantages of outgrower schemes from the company perspective are access to suitable land in the vicinity of the processing unit, secured future timber supplies, the use of cheap rural labor, a spreading of environmental risks across many small plantations, an improved public image and strengthened relationships with local communities (Maansson 2003; Race et al. 2009; David 1984).

One of the most well-known forestry outgrower schemes is Sappi's 'Project Grow' in South Africa (Box 5.4). Over a period of more than two decades, the project has proved that it is possible to contract rural smallholders for the purposes of industrial pulp production.

Issues of concern from the grower perspective are market uncertainty, the viability of the company partner, environmental risks hampering production, high interest rates on loans, and price and interest rate fluctuations. From the company's viewpoint, there are the risks related to the fact that the growers may choose to sell to other buyers, the pressures to convert the land to other uses, environmental hazards, dispute over prices and contract terms, loan defaults, unstable political framework conditions, conflict with environmental organizations and an unstable local business environment (Maansson 2003).

Transaction costs in outgrower schemes are typically rather high. Direct and indirect cost items, such as program costs or provisions for market risks, reduce the payments to the growers. This limits the attractiveness of outgrower schemes, particularly in times of rising timber prices. At the same time, however, these schemes considerably reduce the risk of collapsing output prices for growers.

Overall, outgrower schemes successfully involve rural people in commercial forestry activities by lowering the barriers to entry into industrial production and by providing access to markets. Cash returns from these schemes usually boost the

development of other local businesses. However, their effect in terms of poverty alleviation is limited to an elite (Marcus undated, cited by Cairns 2000).

Box 5.4 Forestry Outgrower Schemes in South Africa: Project Grow

Sappi, one of the big fiber producers in South Africa, started an outgrower scheme for pulpwood plantations with various eucalyptus species in the KwaZulu-Natal province in 1983. Initially designed to provide supplemental income for retired migrant mine workers, it evolved into a viable land use option for community farmers, with access to between 1 and 20 ha of land. In 2010 almost 10,000 growers grew trees on 15,000 ha of community and company land. The project contributes a small but valuable part of the raw material required by the expanding pulp mills (130,000 t of wood fiber in 2010).

The company, through its extension officers, provides technical assistance to the farmers in relation to site selection and site preparation, fertilizer application, planting, weed control and fire management. The company provides improved planting material free of charge, as well as an interest-free loan that can be used to hire labor or to compensate for the grower's own work in planting and monitoring. In addition, the company provides a secure market and competitive prices for the timber at maturity and, at the request of growers, facilitates negotiations between growers and harvesting and transport contractors.

The growers negotiate an agreement with the traditional authority to use community land and water resources for the plantation and contribute their own and/or hired workforce for plantation establishment and management, including monitoring, fire control and final harvesting and transport.

The trees belong to the grower, but the grower is contractually required to sell them to Sappi. Up to 50 % of the final revenues remain with the harvesting and transport service provider, 30 % with the grower as compensation for their own and/or hired labor and 20 % of the final revenues are profit for the grower. In 2005, the total income from a 7-year eucalyptus plantation was USD 3,107/ha, translating into an income of USD 16.86/man-day, and a grower net profit of USD 1,337/ha.

The returns for the grower account for approximately 20 % of the average household income and lift many households above the poverty line. Apart from the reliable financial income, growers also obtain firewood and construction material from their plantations. In addition to growers, non-grower community members also benefit indirectly from increased rural employment opportunities in forest plantations and other business. Several growers have already invested their forestry income in a transport business, forestry service firms or in shops.

(continued)

Box 5.4 (continued)

Challenges facing growers include the theft of timber, competition from other buyers offering slightly higher prices than Sappi, insufficient road infrastructure, bank services that complicate the payout of cash to the growers and relatively high transaction costs for the company.

Source: Howard (2005); Mayers and Vermeulen (2002, 2003); Mncube (2010); Sappi (2006, 2011); Sartorius and Kirsten (2007); Smith (2003)

5.5.6 *Forestry Contractors*

Forestry contractors are independent, specialized entrepreneurs delivering services for forest management operations (UNECE/FAO 2008; Macqueen 2008). Forestry contractors typically do not grow trees themselves, but offer services required for forest management to other forestry enterprises on a contractual basis. Figure 5.7 shows that the land is with the forest enterprise, nearly all other inputs concerning production and management can be provided by contractors. In the context of increasing division of labor, mechanization and the technological specialization of forest management operations, forestry service contractors horizontally integrate the production processes of various forest enterprises into the forestry commodity chain. Typical services provided are forest inventory, forest management planning, planting, weeding, chemical and fertilizer application, felling, skidding, timber transport and consulting services. Although there are also large commercial forest service enterprises, many forest contractor operations in the tropics are of a small and sometimes even informal character (Osei-Tutu and Nhancale 2010).

The skill sets and assets of forest contractors vary widely. Generally, two archetypal service providers can be distinguished: (1) contractors specializing in services that require capital-intensive equipment, aiming for economies of scale and large turnover; for example, skidder and truck owners; and (2) contractors specializing in services that are infrequent but require a high input of largely unskilled labor, such as tree planting or the peeling of bark (Box 5.5). The diversity of forest management operations means that skilled and unskilled workers alike, the poor and those better-off can find employment as forestry contractors, as demonstrated in the example from Vietnam presented in Box 5.5. Nevertheless, the labor productivity of these people and the share of the added value vary significantly, as do their working conditions.

Forest contractors are of considerable importance where strong and competitive markets for forest products exist. With increasing specialization and investment, contractors can potentially benefit from economies of scale and build their capacity to compete for orders. The required skill sets, level of training and the level of sophistication of the equipment increase simultaneously. In order to cover high fixed costs, capital-intensive equipment and highly specialized employees, contractors need to operate at near maximum levels. Activities outside the core business are typically abandoned to increase efficiency.

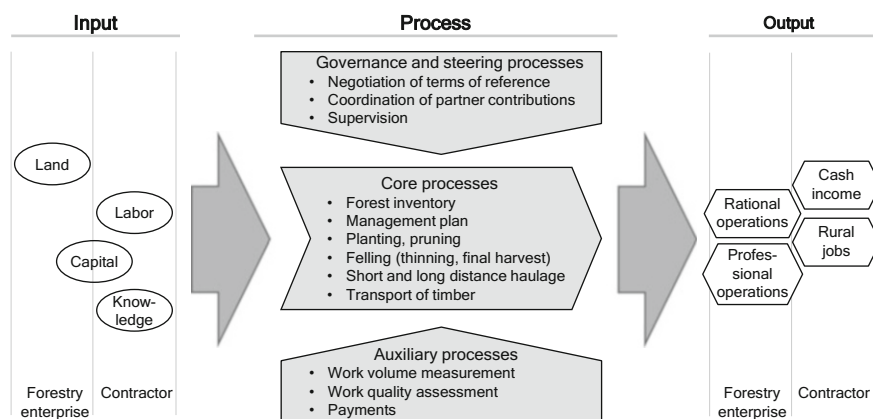


Fig. 5.7 Input, process and output of forestry service providers in Vietnam

For a seamless operation and the accrual of mutual benefits, the partners involved in forest management operations have to establish mutual trust, for example with regard to the quantity of timber delivered, the quality of the produce and the financial transactions. A high level of mutual trust results in significantly lower transaction costs. For instance in the example from Vietnam (Box 5.5), the pulp mill's load weight records are accepted as the basis for the contractor's payments, which saves the stakeholders the effort of making multiple volume/weight measurements. The grower is not part of this alliance, and 'pays' a high price for omission.

Overall, service providers represent a flexible, market-oriented model for forest management through independent and specialized economic units. The biggest advantage of contractors is that they make capital intensive equipment available to small scale producers, thereby allowing them to produce at a cost which is competitive on commercial markets and to cover labor peaks they would not normally be able to manage themselves. Furthermore, forestry contractors potentially create income, jobs and economic demand in rural areas.

Box 5.5 Forest Contractors in Smallholder Tree Plantations in Vietnam

In line with the policy of the Vietnamese government to massively promote tree plantation establishment, villagers from the Thuan Phong village (Phu Cat district), obtained property rights for land set aside for tree plantations in 2005. Since then, approximately 250 households have established more than 800 ha of eucalyptus plantations in rotations of 4–6 years. Planting and tending are typically carried out by the growers themselves. When a stand is ready for harvest, farmers usually sell to local middlemen, obtaining a gross margin of USD 686/ha to USD 897/ha in the process, depending on credit and the costs of hired labor.

(continued)

Box 5.5 (continued)

Five full-time and a small number of part-time local middlemen buy the standing wood for an authorized agent of a pulp mill company. The collector examines the stand and offers the owner a price. If the deal is agreed, the buyer pays an advance of a minimum of 50 %, hires loggers, bark peelers and a truck for transport. On average, 1 ha of forest plantation provides 15 days of employment in the form of planting and maintenance annually and another 11 days for harvesting and transport.

In the village about 20 strong and skilled men work as self-employed loggers, felling the trees with their chainsaws. They are paid according to the amount of wood harvested, which is ascertained by the load weights recorded at the pulp mill. A logger works an average of 3.5 days and receives USD 82.80/ha, leaving him with a net income of USD 10.23/day for his labor. Bark peelers work in teams of 12–17 people, comprising both men and women. One team peels more or less the same amount of timber cut by one feller, approximately 2,000 t per year. No special skills are required to take on the job. Like the others, peelers are paid per ton of peeled timber and earn an income of approximately USD 2.96/day. They also load the truck, earning USD 1.14 per load. Transport is offered by individuals owning a truck. Of the USD 140/ha paid, USD 48.40 remain for labor after the cost of operations, translating into a daily income of USD 16.13. The agent from the pulp mill is paid a provision of USD 30/ha.

Compared to the other stakeholders, the local collectors receive a dis-proportionately large share of the profit; their income amounts to an average USD 310/ha. As most growers are not able to correctly determine the biomass of their trees, collectors usually underestimate the standing biomass deliberately. Up to two-thirds of their income stem from the difference between the true amount and the amount accepted by the tree grower.

Amounts calculated for a 5-year *Eucalyptus urophylla* rotation with a yield of 35 t/ha and an exchange rate of USD 1 \approx 17,500 VND

Source: Kien (2009); Nguyen Quang Tan (2011)

5.6 Outlook

5.6.1 Conclusion

The high competition for resources and the increasing pressure to produce short-term benefits are challenges facing today's forest organizations. This manifests itself in the liquidation of forest resources for the sake of survival, as well as for the maximization of financial profits. The competition for forest land jeopardizes sustainable forest management systems from both ends: by the conversion of forests

to more intensive land use systems and by taking forests out of production for purely conservation purposes. In contrast to such segregated, single objective approaches, integrated forestry systems with multiple functions may be more resilient and tend to be more easily reconcilable with natural and social systems. However, these systems require more sophisticated management, are more prone to conflict and incur higher transaction costs. As each challenge offers opportunities, the members of forest organizations are encouraged to identify the opportunities available to them and to take them on. There are many actors in the arena, each with their own individual perception of and agenda for rural development. Ultimately the rural people must obtain an overview and understand the situation, identify the right partners to support their livelihoods in a sustainable way, and band together to negotiate with opponents in order to achieve fair compromises. Their skills and competences, in other words their human and social capital, will determine the future of their organizations and of their forests. There are many technical solutions available. The capacity to take up the challenge, to design adaptive and intelligent solutions, and to implement these, will ultimately determine the performance of forest organizations and their contribution to rural development as well as to other global challenges. The recognition of smallholders as important actors in adapting to global change underlines their prominent position in the future.

The following aspects are deemed essential for the further development of forest organizations towards ‘working’ and ‘sustainable’ arrangements for forest management:

5.6.2 Steering, Monitoring and Enforcement

Steering, monitoring and enforcement are based on personal capacity, attitude and motivation. The following factors are elemental in developing these capacities: education, empowerment and responsibility.

5.6.2.1 Education

Traditional knowledge is recognized as a valuable resource for sustainable forest management that complements the available scientific knowledge on forest management. However, under the terms of current and future global competition, forest organizations must also acquire professional business and organizational skills, the capacity to negotiate, to build partnership networks and effective regulating institutions, and they must compete and coexist with other players on the factor markets. The education and training required to develop such managerial skills will become a necessity for the managers and leaders of future forest organizations, if they are to achieve integrated and adapted management characterized by mutual benefits and sustainability (cf. Macqueen 2012; Jolliffe 2004).

5.6.2.2 Empowerment

Often there is a high level of interdependence between forests and poor or disadvantaged groups. Empowering and improving the living conditions of these groups can strengthen sustainable forest management. Group-based forest organizations are one way of attaining this goal.

To maintain established forestry policies and programs beneficial to the poor, these must be reviewed and amended continuously (Bhattarai et al. 2007). While Regmi et al. (2009) focus on capacity building support as a complement to required institutional reforms Hobley (2007) recommends integrating government, private sector and state-incorporated civil society.

5.6.2.3 Responsibility

The struggle for a fair distribution of the benefits derived from forests is at the center of forest governance. To sustain the flow of benefits, the inputs have to be delivered by the various parties:

Coordinated by forest organizations, activities on the ground have to be realized by their members. Monitoring in particular has been highlighted as being crucial to success (Singh et al. 2011; van Laerhoven 2010).

It is the responsibility of governments to stipulate frame conditions which are supportive to sustainable forest management. As superior institutions, they must secure efficient supervision, enforcement and facilitation. The latter includes the coordination of forest organizations and other relevant actors, the dissemination of information, communication, cooperation and negotiation (Carter and Gronow 2005; Aggarwal et al. 2010).

5.6.3 Fair Partnerships

Fair partnerships are crucial for sustainable development (Vermeulen et al. 2003) and for the future of forest organizations. Partnerships can be established through various types of formal and informal arrangement. They are a means to share risks (Mayers and Vermeulen 2002) and to lower transaction costs. Strategic partnerships involve the partner's core business activities. They are widely promoted for civil society-business collaboration (Ashman 2001).

5.6.4 Policies

Policies enable the forest organizations to achieve sustainable forest management. Essential in this respect are the fair allocation of property rights, including land

tenure (Hobley 2007; Adhikari et al. 2004); the facilitation of sustainable value chains, connecting rural producers with national and global markets (Mayers and Vermeulen 2002); and the securing of organizational agreements such as outgrower schemes to the mutual benefit of all of the partners.

5.6.5 Forest Organizations in a Diversified, Intelligent Pro-nature Economy

Both the consumption patterns of individuals and the growing population result in a rising demand for an ever larger number of services and products from forest ecosystems. At the same time, (natural) forests tend to be increasingly degraded and converted. The challenge for forest organizations is to use the available resources to ‘grow’ more market and non-market products and to provide services. This can be attained by higher efficiency of processes within the forest organizations, which also fosters the resilience of the organizations.

5.6.6 Recommendation

In an increasingly complex forest management setting, the plain copy of a generic model for a particular place will not necessarily succeed. First, location specific, essential success factors have to be identified and understood. Then the design of the intended organizational model needs to be reviewed and adapted to serve under the specific natural and social conditions. The badly needed adaptive and learning skills challenge the people assigned with the management of forests. Designing efficient organizational structures and processes for a given set of factors is the ‘fine art’ of management and leadership.

References

- Adhikari B, Di Falco S, Lovett JC (2004) Household characteristics and forest dependency: evidence from common property forest management in Nepal. *Ecol Econ* 48(2):245–257. doi:[10.1016/j.ecolecon.2003.08.008](https://doi.org/10.1016/j.ecolecon.2003.08.008)
- Aggarwal PK, Baethegan WE, Cooper P, Gommers R, Lee B, Meinke H, Rathore LS, Sivakumar MVK (2010) Managing climatic risks to combat land degradation and enhance food security: key information needs. *World Climate Conference – 3. Procedia Environ Sci* 1:305–312. doi:[10.1016/j.proenv.2010.09.019](https://doi.org/10.1016/j.proenv.2010.09.019)
- Agrawal A (2005) *Environmentality: technologies of government and political subjects*. Oxford University Press, New Delhi
- Andersen ES (2010) The X model – a tool for describing and assessing individual projects. *Int J Manag Proj Bus* 3(3):369–386. doi:[10.1108/17538371011056039](https://doi.org/10.1108/17538371011056039)
- Arnold J (2001) *Forests and people: 25 years of community forestry*. <http://www.treesforlife.info/fao/Docs/P/25y.pdf>. Accessed 11 Apr 2012

- Ashman D (2001) Civil society collaboration with business: bringing empowerment back in. *World Dev* 29(7):1097–1113. doi:[10.1016/S0305-750X\(01\)00027-4](https://doi.org/10.1016/S0305-750X(01)00027-4)
- Auch E (2007) Überlebensstrategien waldbutzender Familienwirtschaften im Apuseni-Gebirge, Rumänien – sustainable livelihoods analyse und Handlungsempfehlungen. Schriften aus dem Institut für Forstökonomie der Universität Freiburg, vol 27. Verlag des Instituts für Forstökonomie der Universität Freiburg, Freiburg im Breisgau
- Bakarr MI (2005) Forested landscapes and community development: science, scale, and sustainability. In: CIFOR (ed) *Towards a shared vision and action frame for community forestry in Liberia*. Proceedings of the first international workshop on community forestry in Liberia. CIFOR, Bogor Barat, pp 12–16
- Bass SM (1992) Building from the past: forest plantations in history. In: Sargent C, Bass SC (eds) *Plantation politics. Forest plantations in development*. Earthscan, London, pp 41–75
- Bastakoti RR (2005) Evaluation of collective action in forest users' groups (Case study from Dhading District, Nepal). Masterarbeit, Technische Universität Dresden
- Bhattarai B, Dhungana SP, Kafley GP (2007) Poor-focused common forest management: lessons from Leasehold Forestry in Nepal. *J Forest Livelihood* 6(2):20–29
- Binswanger HP, Rosenzweig MR (1986) Behavioural and material determinants of production relations in agriculture. *J Dev Stud* 22(3):503–539. doi:[10.1080/00220388608421994](https://doi.org/10.1080/00220388608421994)
- Blank W (2006) Die kolonialwirtschaftliche Forstnutzung der ehemaligen Kolonie Deutsch-Ostafrika. Masterarbeit, Technische Universität Dresden
- Bromley DW (1989) *Economic interests and institutions. The conceptual foundations of public policy*. Blackwell, Oxford
- Cairns RI (2000) Outgrower timber schemes in Kwazulu–Natal. Do they build sustainable rural livelihoods and what interventions should be made? Instruments for sustainable private sector forestry, South Africa Series, Pretoria
- Campbell B, Mandondo A, Nematundwe N, Sithole B, de Jong W, Luckert M, Matose F (2001) Challenges to proponents of common property resource systems: despairing voices from the social forests of Zimbabwe. *World Dev* 29(4):589–600. doi:[10.1016/S0305-750X\(00\)00114-5](https://doi.org/10.1016/S0305-750X(00)00114-5)
- Carter J, Gronow J (2005) Recent experience in collaborative forest management. A review paper, vol 43, CIFOR occasional paper. CIFOR, Jakarta
- Chrobok R, Büchi R (1996) *Grundbegriffe der organisation – GBO*, vol 1, 2nd edn, GfürO-Reihe organisation. Schäffer-Poeschel, Stuttgart
- Coase RH (1937) The nature of the firm. *Economia New Ser* 4(16):386–405
- Colchester M, Apte T, Laforge M, Madondo A, Pathak N (2003) Bridging the gap: communities, forests and international networks. Synthesis report of the project 'Learning Lessons from International Community Forestry Networks'. http://www.cifor.org/publications/pdf_files/OccPapers/OP-41.pdf. Accessed 31 July 2012
- Coleman EA, Steed BC (2009) Monitoring and sanctioning in the commons: an application to forestry. *Ecol Econ* 68(7):2106–2113. doi:[10.1016/j.ecolecon.2009.02.006](https://doi.org/10.1016/j.ecolecon.2009.02.006)
- Cox M, Arnold G, Tomás SV (2010) A review of design principles for community-based natural resource management. *Ecol Soc* 15(4):38
- Cronkleton P, Guariguata MR, Albornoz MA (2012) Multiple use forestry planning: Timber and Brazil nut management in the community forests of Northern Bolivia. Multiple use of tropical forests: from concept to reality. *Forest Ecol Manag* 268:49–56. doi:[10.1016/j.foreco.2011.04.035](https://doi.org/10.1016/j.foreco.2011.04.035)
- Darr D (2003) Farm forestry in semi-subsistence and monetary economies and its interdependency with the land tenure system – case studies from central Laos. M.Sc. thesis, Technische Universität Dresden
- David JG (1984) Contract farming and smallholder outgrower schemes in less-developed countries. *World Dev* 12(11–12):1143–1157. doi:[10.1016/0305-750X\(84\)90008-1](https://doi.org/10.1016/0305-750X(84)90008-1)
- Dhakal B, Bhatta B (2009) An institutional model to explain utilization problems of community forest products. *Int J Soc Forest* 2(2):23–48

- Dillon HS (1992) Contract farming in Indonesia. The dairy and rubber industries. In: Glover D, Ghee LT (eds) *Contract farming in Southeast Asia. Three country studies*. Institute for Advanced Studies, University of Malaya, Kuala Lumpur, pp 119–156
- Dougill AJ, Soussan JG, Kiff E, Springate-Baginski O, Yadav NP, Dev O, Hurford AP (2001) Impacts of community forestry on farming system sustainability in the Middle Hills of Nepal. *Land Degrad Dev* 12(3):261–276. doi:[10.1002/ldr.438](https://doi.org/10.1002/ldr.438)
- Ellis F (1992) *Peasant economics. Farm households and agrarian development*, 2nd edn, Wye studies in agricultural and rural development. Cambridge University Press, Cambridge
- Emery FE, Trist E (1965) The causal texture of organizational environments. *Hum Relat* 18 (1):21–32. doi:[10.1177/001872676501800103](https://doi.org/10.1177/001872676501800103)
- FAO (1978) *Forestry for local community development*, vol 7, Forestry paper. Food and Agriculture Organization of the United Nations, Rome
- FAO (2001) *Forestry out-grower schemes: a global overview*. Report based on the work of D. Race and H. Desmond. Forest plantation thematic papers, working paper. FAO, Rome
- FAO (2010) *Global forest resources assessment 2010. Main report*, vol 163, FAO forestry paper. Food and Agriculture Organization of the United Nations, Rome
- Gaitanidis M (2007) *Prozessorganisation. Entwicklung, Ansätze und Programme des Managements von Geschäftsprozessen*, 2nd edn. Vahlens Handbücher der Wirtschafts- und Sozialwissenschaften. Vahlen, München
- Glover D, Ghee LT (eds) (1992) *Contract farming in Southeast Asia. Three country studies*, vol 5, Monograph series. Institute for Advanced Studies, University of Malaya, Kuala Lumpur
- Guha R (1983) *Forestry in British and post-British India: a historical analysis*. *Econ Polit Wkly* 18 (44):1882–1896
- Hartzsch H (1983) *Wälder und Forstwirtschaft in der VDR Laos – ein Beitrag zum Stand und zu den Entwicklungstendenzen der laotischen Forstwirtschaft und der forstlichen Ausbildung*. Dissertation, Technische Universität Dresden
- Hobley M (2007) Where in the world is there pro-poor forest policy and tenure reform? http://www.rightsandresources.org/documents/files/doc_658.pdf. Accessed 25 Jan 2012
- Honadle G (1999) *How context matters. Linking environmental policy to people and place*. Kumarian Press, West Hartford, Connecticut, USA
- Howard MMPMDBLFI (2005) *Small-scale timber production in South Africa: what role in reducing poverty?* Discussion paper. International Institute for Environment and Development (IIED), London
- ITTO (2003) *Restoring the forests. Introducing the ITTO guidelines for the restoration, management and rehabilitation of degraded and secondary tropical forests*. http://www.ito.int/direct/topics/topics_pdf_download/topics_id=3670000&no=1&disp=inline. Accessed 01 May 2012
- Iversen V, Chhetry B, Francis P, Gurung M, Kalle G, Pain A, Seeley J (2006) High value forests, hidden economies and elite capture: evidence from forest user groups in Nepal's Terai. *Ecol Econ* 58(1):93–107. doi:[10.1016/j.ecolecon.2005.05.021](https://doi.org/10.1016/j.ecolecon.2005.05.021)
- James NDG (1990) *A history of English forestry*, vol 2. Basil Blackwell, Oxford
- Jolliffe D (2004) The impact of education in rural Ghana: examining household labor allocation and returns on and off the farm. *J Dev Econ* 73(1):287–314. doi:[10.1016/j.jdeveco.2003.02.002](https://doi.org/10.1016/j.jdeveco.2003.02.002)
- Jørgensen I, Vivekanandan K (2003) *Private forestry based on Paulownia in Sri Lanka. An appraisal of the outgrower scheme by Paulownia Plantations Ltd*. Noragric Report, Ås
- Kaimowitz D (2005) The international experience with community forestry. In: CIFOR (ed) *Towards a shared vision and action frame for community forestry in Liberia*. Proceedings of the first international workshop on community forestry in Liberia. CIFOR, Bogor Barat, pp 17–19
- Kanel Raj K, Acharya DP (2008) Re-inventing forestry agencies: institutional innovation to support community forestry in Nepal. In: Durst P et al (eds) *Re-inventing forestry agencies. Experiences of institutional restructuring in Asia and the Pacific*, vol 3. FAO Regional Office for Asia and the Pacific, Bangkok, pp 132–160

- Kien ND (2009) Improvement of Eucalyptus plantations grown for pulp production. Ph.D., Sveriges Lantbruksuniversitet
- Kinsey BH, Binswanger HP (1993) Characteristics and performance of resettlement programs: a review. *World Dev* 21(9):1477–1494. doi:[10.1016/0305-750x\(93\)90128-V](https://doi.org/10.1016/0305-750x(93)90128-V)
- Larson AM, Barry D, Dahal GR (2010) New rights for forest-based communities? Understanding processes of forest tenure reform. *Int For Rev* 12(1):78–96. doi:[10.1505/for.12.1.78](https://doi.org/10.1505/for.12.1.78)
- Le Hung Cuong (1988) Zur Organisation der forstlichen Produktion in den Forstwirtschaftsbetrieben der SR Vietnam. Dissertation, Technische Universität Dresden
- Li B, Li Nana, Liu X (eds) (2004) Transformation and countermeasures on business operation models in uncertain environment. The fourth international conference on electronic business (ICEB2004), Beijing
- Little PD, Watts M (eds) (1994) Living under contract. Contract farming and agrarian transformation in Sub-Saharan Africa. University of Wisconsin Press, Madison
- Maansson M (2003) A review of principles, criteria and indicators of best practice in outgrower schemes. In: FAO (ed) Towards equitable partnerships between corporative and smallholder partners. Workshop synthesis. Food and Agriculture Organization of the United Nations, Rome, pp 27–32
- Macqueen D (2008) Supporting small forest enterprises: a cross-sectoral review of best practice, vol 23, IIED small and medium forestry enterprise series. IIED, London
- Macqueen D (2012) Enabling conditions for successful community forest enterprises. *Small-Scale Forest* 1–19. doi: [10.1007/s11842-011-9193-8](https://doi.org/10.1007/s11842-011-9193-8)
- Marcus T (undated) KwaZulu-Natal provincial synthesis report. Land and Agriculture Policy Centre, Land Reform Research Programme
- Mayers J, Vermeulen S (2002) Company-community forestry partnerships: from raw deals to mutual gains? An international review with proposals for improving forests, enterprise and livelihoods, Instruments for sustainable private sector forestry series. Earthprint, London
- Mayers J, Vermeulen S (2003) Company-community forestry partnerships: from raw deals to mutual gains? In: FAO (ed) Towards equitable partnerships between corporative and smallholder partners. Workshop synthesis. Food and Agriculture Organization of the United Nations, Rome, pp 133–144
- Miebach B (2009) Prozesstheorie. Analyse, organisation und system. VS Verlag für Sozialwissenschaften/GWV Fachverlage GmbH Wiesbaden, Wiesbaden
- Mighell RL, Jones LA (1963) Vertical coordination in agriculture. Farm economics division, economic research service, U.S. Dept. of Agriculture, Washington
- Mncube D (2010) Sappi's project grow – presentation by Dinga Mncube. Executive insight. Mark Roux, Deloitte South Africa, Deloitte Eminent Speaker Event
- Nagendra H, Gokhale Y (2008) Management regimes, property rights, and forest biodiversity in Nepal and India. *Environ Manag* 41:719–733. doi:[10.1007/s00267-008-9073-y](https://doi.org/10.1007/s00267-008-9073-y)
- Naina HA (2011) Impact of taungya implementation in the collaborative forest management (CBFM) program towards the livelihoods improvement of the forest village community in West Java, Indonesia. Masterarbeit, TU Dresden
- Nair PKR (1993) An introduction to agroforestry. Kluwer Academic Publishers in cooperation with International Centre for Research in Agroforestry, Dordrecht
- Negussie AD (2003) Farm forestry decision-making strategies of the Guraghe households, Southern-Central Highlands of Ethiopia. Dissertation, TU Dresden
- Nguyen Quang Tan (2011) Chopping for chips. An analysis of wood lows from smallholder plantations in Vietnam. Working paper, vol 65. CIFOR, Bogor
- Nsiah B (2010) Contribution of smallholder farm forest plantation management to livelihood strategies of farm households in the high forest zone of Ghana. Doctoral, TU Dresden
- Osei-Tutu P, Nhancale B (2010) Hidden forestry revealed. Characteristics, constraints and opportunities for small and medium forest enterprises in Ghana. International Institute for Environment and Development (IIED), London

- Ostrom E (1990) *Governing the commons. The evolution of institutions for collective action*, vol 1. Cambridge University Press, Cambridge
- Otsuka K, Larson DF (2013) Towards a green revolution in Sub-Saharan Africa. In: Otsuka K, Larson DF (eds) *An African green revolution. Finding ways to boost productivity on small farms*. Springer, Dordrecht, pp 281–300
- Pérez MR, Belcher B, Fu M, Yang X (2004) Looking through the bamboo curtain: an analysis of the changing role of forest and farm income in rural livelihoods in China. *Int For Rev* 6 (3–4):306–316. doi:[10.1505/for.6.3.306.59968](https://doi.org/10.1505/for.6.3.306.59968)
- Poffenberger M, McGean B (eds) (1996) *Village voices, forest choices: joint forest management in India*. Oxford University Press, New Delhi
- Pokhare BK, Nurse M (2004) Forests and people's livelihoods: benefiting the poor from community forestry. http://communityforestry-nscfp.org/files/listingfiles/MicrosoftWord-Propoorframe_DP303mike071103.pdf. Accessed 24 Jan 2012
- Prasad R, Bhatnagar P (1995) *Social forestry experiences over a decade*. International Book Distributors, Dehra Dun
- Pretzsch J (2005) Forest related rural livelihood strategies in national and global development. *Forest Trees Livelihood* 15:115–127
- Pretzsch J (2010) Forest organisations in change. Examples from the tropics and subtropics. In: Spathelf P (ed) *Sustainable forest management in a changing world: a European perspective*. Springer, Heidelberg, pp 191–215
- Race D, Bisjoe AR, Hakim R, Hayati N, Julmansyah N, Kadir A, Kurniawan A, Kusumedi P, Nawir AA, Nurhaedah AA, Perbatasari D, Purwanti R, Rohadi D, Stewart H, Sumirat B, Suwarno A (2009) Partnerships for involving small-scale growers in commercial forestry: lessons from Australia and Indonesia. *Int Forest Rev* 11(1):88–97
- Regmi BR, Albano A, Kumar C, Sharma GB (2009) Improving the livelihoods of the poor and marginalized in Nepal through leasehold forestry and livestock program: a review of institutional constraints and opportunities. *Banko* 18(2):10–17. doi:[10.3126/banko.v18i2.2168](https://doi.org/10.3126/banko.v18i2.2168)
- Royo N (2011) Why tenure reform is needed in Asia. *ITTO Trop Forest Update* 20(4):9–10
- de Rueda RA (2008) Re-inventing the forestry agencies of the Department of Environment and Natural Resources, Philippines: a case study. In: Durst P et al (eds) *Re-inventing forestry agencies. Experiences of institutional restructuring in Asia and the Pacific*, vol 2. FAO Regional Office for Asia and the Pacific, Bangkok, pp 79–102
- Sappi (2006) Project grow report 28 June 2006. http://environment.yale.edu/tfd/uploads/SAPPI_Project_Grow_Report.pdf. Accessed 19 Feb 2012
- Sappi (2011) Southern Africa sustainability report 2011. http://www.sappi.com/regions/sa/Sustainability/Documents/2011_Sappi_Southern_Africa_Sustainability_Report.pdf. Accessed 26 July 2012
- Sartorius K, Kirsten J (2007) A framework to facilitate institutional arrangements for smallholder supply in developing countries: an agribusiness perspective. *Food Pol* 32(5–6):640–655. doi:[10.1016/j.foodpol.2007.03.001](https://doi.org/10.1016/j.foodpol.2007.03.001)
- Schlager E, Ostrom E (1992) Property-rights regimes and natural resources. A conceptual analysis. *Land Econ* 68(3):249–262
- Schober H (2002) *Prozessororganisation. Theoretische Grundlagen und Gestaltungsoptionen*. Gabler Edition Wissenschaft. Dt. Univ.-Verl, Wiesbaden
- Schreckenberg K, Luttrell C, Moss C (2006) Participatory forest management: an overview – background paper. <http://www.odi.org.uk/resources/docs/3781.pdf>. Accessed 16 Apr 2012
- Singh VS, Pandey DN, Prakash NP (2011) What determines the success of joint forest management? Science-based lessons on sustainable governance of forests in India. *Resour Conserv Recycl* 56(1):126–133. doi:[10.1016/j.resconrec.2011.09.015](https://doi.org/10.1016/j.resconrec.2011.09.015)
- Smith D (2003) Sappi forests: project grow. In: FAO (ed) *Towards equitable partnerships between corporate and smallholder partners. Workshop synthesis*. Food and Agriculture Organization of the United Nations, Rome, pp 169–173
- Stogdill RM (1967) Basic concepts for a theory of organization. *Manage Sci* 13(10): B-666. doi:[10.1287/mnsc.13.10.B666](https://doi.org/10.1287/mnsc.13.10.B666)

- Thoms C, Karna BK, Karmacharya MB (2006) Limitations of leasehold forestry for poverty alleviation in Nepal. *Soc Nat Resour* 19:951–958. doi:[10.1080/08941920600902179](https://doi.org/10.1080/08941920600902179)
- Tuan DA (2006) Governance structure and performance. A comparative institutional analysis of community forest management. Dissertation, TU Dresden
- Turyahabwe N, Banana A (2008) An overview of history and development of forest policy and legislation in Uganda. *Int Forest Rev* 10(4):641–656
- UNECE/FAO (2008) Guide to good practice in contract labour. Report of the UNECE/FAO team of specialists on best practices in forest contracting. FAO, Rome
- Uphoff N (1993) Grassroots organizations and NGOs in rural development: opportunities with diminishing states and expanding markets. *World Dev* 21(4):607–622. doi:[10.1016/0305-750X\(93\)90113-N](https://doi.org/10.1016/0305-750X(93)90113-N)
- van Laerhoven F (2010) Governing community forests and the challenge of solving two-level collective action dilemmas—a large-N perspective. Governance, complexity and resilience. *Glob Environ Chang* 20(3):539–546. doi:[10.1016/j.gloenvcha.2010.04.005](https://doi.org/10.1016/j.gloenvcha.2010.04.005)
- van Noorwijk M, Tomich TP (1995) Agroforestry technologies for social forestry. Tree-crop interactions and forestry-farmer conflicts. In: Hartadi SH, Sumardi SS, Iswantoro H (eds) *Social forestry and sustainable forest management*. Perum Perhutani, Jakarta, pp 168–193
- Vermeulen S, Nawir AA, Mayers J (2003) Better livelihoods through partnership? A review of the impacts of deals between communities and forestry companies on local development. Paper presented at the international conference on rural livelihoods, forests and biodiversity, Bonn, 19–23 May 2003
- Watts M (1994) Life under contract: contract farming, agrarian restructuring, and flexible accumulation. In: Little PD, Watts M (eds) *Living under contract. Contract farming and agrarian transformation in Sub-Saharan Africa*. University of Wisconsin Press, Madison, pp 21–77
- White A, Martin A (2002) Who owns the world's forests? Forest tenure and public forests in transition. *Forest Trends*, Washington
- Wiersum KF (1999) Social forestry. Changing perspectives in forestry science or practice? Ph.D. thesis, Wageningen Agricultural University, Wageningen
- Wiersum KF (2010) Community forestry between local autonomy and global encapsulation. [http://www.forestrynepal.org/images/02-Presented Papers and Powerpoints/Papers/05-Freerk Wiersum Paper.pdf](http://www.forestrynepal.org/images/02-Presented%20Papers%20and%20Powerpoints/Papers/05-Freerk%20Wiersum%20Paper.pdf). Accessed 11 Apr 2012
- World Bank (1978) Forestry. Sector policy paper. <http://documents.worldbank.org/curated/en/1978/02/440307/forestry>. Accessed 07 July 2012
- Xayvongsa L (2001) Beurteilung bäuerlichen Teakanbaus mittels Betriebssystemanalyse in Luang Prabang, Laos. Assessment of Teak related Farming Systems in Luang Prabang, Laos. Ph.D. thesis, Technische Universität Dresden, Dresden
- Zitzmann G (1998) Multiple use and livelihood strategies in mopane woodland. The case of Ditladi, North-East District, Botswana. M.Sc. thesis, Technische Universität Dresden, Dresden
- Zivnуска J (1966) The integration of forest development plans and national development plans. How to make the forestry case at the national level. Proceedings of the 6th world forest congress, Madrid